READING MATERIAL
CLEAN FUELS

What Are Clean Fuels?

The most familiar transportation fuels in this country are gasoline and diesel fuel, but some vehicle fuels, called "clean fuels," create less pollution than today's conventional gasolines. These include alcohols, electricity, natural gas, and propane. There is still a degree of scientific uncertainty regarding the impacts of these "clean fuels," and, hence, a need to continue research on them.

Why Switch to Clean Fuels?

Cars operating on conventional gasolines emit a complex mixture of compounds that are hazardous and toxic and can lead to the formation of smog. A lot has been done to reduce automobile pollution, including development of innovative emission control technologies and establishment of inspection and maintenance programs. These gains largely are being offset by an increasing number of cars on the road and people traveling more miles each year. Thus, the pollution control measures taken so far have not been sufficient to solve the smog problem in many large cities.

Clean fuels have a number of inherent properties that make them cleaner than conventional gasoline. In general, these fuels emit lesser amounts of hydrocarbons that are less reactive (slower to form smog) and less toxic. Emissions from electrical, natural gas, or alcohol-powered vehicles can be as much as 90 percent lower in toxics and smog-forming hydrocarbons than emissions from vehicles fueled with conventional gasoline. In addition, new gasoline formulations ("reformulated gasoline") may be able to reduce emissions from gasoline-powered vehicles by up to 25 percent.

Use of clean fuels also could help to slow the atmospheric buildup of carbon dioxide, a "greenhouse gas" that contributes to the potential for global warming. Combustion of any carbon-based fuel produces carbon dioxide, but in general, fuels produced from biomass (such as crops and trees) and natural gas result in less carbon dioxide accumulation than fuels made from petroleum or coal.

Clean fuels have benefits that reach beyond their air quality advantage. New fuels in the marketplace give consumers new choices and could decrease our dependence on imported oil.

Electricity

Battery powered vehicles give off virtually no pollution and offer one of the best options for reducing motor vehicle emissions in polluted cities. Power plants that produce electricity do pollute, but these plants are often in rural areas where the emissions do not drive pollution levels above health standards. Also, efficient emission controls can be installed and maintained more easily on individual power plants than on millions of vehicles. The driving range of today's electric cars is limited by the amount of power the battery can provide. Current batteries take hours to recharge and the cost of electric vehicles is high. Recent developments in electric vehicle technology show much promise for reducing these disadvantages.

Ethanol

Ethanol ("grain alcohol") is the primary automotive fuel in Brazil, and ethanol/gasoline blends (known as "gasohol") have been used in the United States for many years. Pure ethanol fuel offers excellent performance plus low hydrocarbon and toxic emissions. It can be produced domestically from corn or other crops, potentially

minimizing the accumulation of greenhouse gases. With current technology and price structures, ethanol is more expensive than gasoline, but new production technologies offer the hope of significantly reduced cost.

Methanol

Methanol ("wood alcohol"), like ethanol, is a high-performance liquid fuel that emits low levels of toxic and smog-forming compounds. It can be produced from natural gas at prices comparable to gasoline, and also can be produced from coal or wood. All major auto manufacturers have produced cars that run on "M85," a blend of 85 percent methanol and 15 percent gasoline, and many auto manufactures have developed advanced prototypes that burn pure methanol ("M100"). Methanol has long been the fuel of choice for race cars because of its superior performance and fire safety characteristics.

Propane

Natural gas is abundant and widely used for home heating and industrial processes. It is easily transported through pipelines and costs about the same or slightly less than gasoline. Compressed natural gas (CNG) vehicles emit low levels of toxics and smog-forming hydrocarbons, but CNG fuel must be stored in heavy, costly tanks. There are significant tradeoffs for CNG vehicles among emissions, vehicle power, efficiency, and range; however, natural gas already is used in some fleet vehicles and appears to have a bright future as a motor vehicle fuel.

Reformulated Gasoline

The petroleum industry is developing gasoline formulations that emit less hydrocarbons, carbon monoxide, and toxics than today's fuels. These new gasolines can be introduced without major modification to existing vehicles or the fuel distribution system. The Clean Air Act requires some gasoline modifications to reduce carbon monoxide emissions as early as 1992 and use of reformulated gasoline in certain polluted cities beginning in 1995.

Are Clean Fuels Feasible?

Clean-fueled vehicles have already been built and widespread use in the near future is feasible. To enable the transition, technologies must be refined so vehicles can achieve optimum emissions performance, consumers must accept the new vehicles and fuels, and government and industry must cooperate to ensure their availability. It will take a concerted effort by all parts of society, but a switch to clean fuels is the most viable way for many cities to attain clean and healthy air.

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